

WHAT IS CLAIMED IS:

1. An ink jet recording apparatus comprising a main-tank for storing ink, a sub-tank for directly  
5 supplying ink to a recording head for carrying out the printing operation to a recording medium by ejecting ink, ink supply means for supplying a predetermined amount of ink from said main-tank to said sub-tank, and ink discharge means for discharging ink in said  
10 sub-tank, wherein

assuming that the maximum amount of ink capable of being stored in said sub-tank is represented by A, an amount of residual ink remaining in said sub-tank after the ink has been discharged by said ink  
15 discharge means is represented by "a", a ratio by weight of a volatile component in the ink used is represented by B and a ratio of a colorant concentration of the ink at saturated state by repeating the ink supply and the ink discharge, to an  
20 initial colorant concentration of the ink is represented by R, the A, the "a" and the B is set so as to satisfy the following equation:

$$A / (A - a \times B) = R \leq 1.20$$

25 2. An ink jet recording apparatus as claimed in claim 1, wherein R is determined so that the difference in color difference  $\Delta E$  between an image

recorded with ink having the initial colorant concentration and an image recorded with ink in which the colorant concentration condensed to the saturated value is within 10 in a CIE1976 L\*a\*b\* color space.

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3. An ink jet recording apparatus as claimed in claim 1, wherein R is not greater than 1.15.

4. An ink jet recording apparatus as claimed in  
10 claim 1, wherein a porous material is provided in the interior of said sub-tank.

5. An ink jet recording apparatus as claimed in claim 1, wherein a porous material and a gap to be  
15 filled with ink are provided in the interior of said sub-tank.

6. An ink storage container for storing a predetermined amount of ink so that the ink is  
20 directly supplied to a recording head for carrying out the recording operation on a recording medium by the ejection of ink; the stored ink being discharged therefrom when the recording operation is not carried out; wherein

25 assuming that the maximum amount of ink capable of being stored therein is represented by A, an amount of residual ink remaining therein after the stored ink

has been discharged is represented by "a", a ratio by weight of a volatile component in a composition of ink used is represented by B and a ratio of a colorant concentration of ink at saturated state made by repeating ink supply and ink discharge, to an initial colorant concentration of said ink is represented by R, said ink storage container is formed to have the amount "a" of residual ink and the maximum amount A of ink satisfying the following equation:

10           
$$A / (A - a \times B) = R \leq 1.20$$

7. An ink cartridge comprising an ink storage container as claimed in claim 6 and an ink jet head supplied with ink from said container, for carrying out the recording operation by ejecting ink supplied from said container.